DEVELOPMENT OF A RESULT-BASED MANAGEMENT SYSTEM FOR TERTIARY INSTITUTION STUDENTS: A CASE STUDY OF COMPUTER SCIENCE DEPARTMENT, UNIVERSITY OF BENIN

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BENIN CITY

NIGERIA.

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PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE, FACULTY OF PHYSICAL SCIENCES, UNIVERSITY OF BENIN, EDO STATE, NIGERIA. IN PARTIAL FULFILLMENT OF THEREQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.Sc.) DEGREE IN COMPUTER SCIENCE.

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CERTIFICATION

This is to certify that this project titled: **"DEVELOPMENT OF A RESULT-BASED MANAGEMENT SYSTEM FOR TERTIARY INSTITUTION STUDENTS (A CASE STUDY OF COMPUTER SCIENCE DEPARTMENT, UNIVERSITY OF BENIN)"** is carried out by **OKOH VICTOR GODSPOWER (PSC2105379)** and it meets the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science Department, University of Benin, Benin City, Edo State, Nigeria.

……. **…….**

DR. (MRS.) R.O. OSASERI **DATE**

(Project Supervisor)

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DR. (MRS.) A.R. USIOBAIFO **DATE**

(Head Of Department)

APPROVAL

This project work is hereby approved in partial fulfillment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science from the University of Benin.

……...… **……**

DR. (MRS.) A.R. USIOBAIFO **DATE**

(Head Of Department)

DEDICATION

This project report, which is on "**DEVELOPMENT OF A RESULT-BASED MANAGEMENT SYSTEM FOR TERTIARY INSTITUTION STUDENTS** (A CASE STUDY OF COMPUTER SCIENCE DEPARTMENT, UNIVERSITY OF BENIN)", is dedicated to God Almighty for his grace, mercies, gift of life, and strength in bringing this project to success.

This work is also dedicated to my family for their strong support towards my education. It has been my guidance, source of strength, and motivation throughout the project.

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ABSTRACT

Tertiary institutions face significant challenges in managing student academic records, often relying on manual or semi-automated systems. These outdated methods frequently lead to delayed result processing, computational inaccuracies, and a lack of real-time access to academic performance data, ultimately hindering institutional efficiency and student development.

This project addresses these issues through the design and implementation of a Result-Based Management System (RBMS). The system automates the computation and management of student results, featuring interactive dashboards for students and administrative staff, and generates standardized reports for lecturers, department administrators, and students. Using the Computer Science Department at the University of Benin as a case study, this project demonstrates the critical need for tertiary institutions to adopt automated solutions for tracking and analyzing student performance.

The developed RBMS is a robust digital platform that includes modules for calculating Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA), alongside providing real-time academic analytics. Constructed as a web-based application, the system utilizes HTML, CSS, PHP, JavaScript, jQuery, and MySQL. The project methodology follows the Structured System Analysis and Design Method (SSADM), ensuring a systematic approach by deconstructing complex processes into clear, manageable stages. The successful implementation of this system not only resolves the inefficiencies of manual result computation but also serves as a scalable model for digital transformation within academic administration.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The administration of tertiary institutions in Nigeria is increasingly challenged by the demand for precise, efficient, and easily accessible academic result management. A core function of any university, the processing of student results, remains largely manual or semi-automated in many institutions, including the University of Benin. Dependence on physical mark sheets and spreadsheet software like Microsoft Excel introduces substantial risks of human error, data inconsistency, and operational delays. Industry surveys indicate that approximately 68% of Nigerian universities experience result release delays of three to six weeks, a direct consequence of these inefficient systems.

The paradigm in higher education management is shifting from activity-based reporting—such as quantifying courses offered—towards a focus on measurable student outcomes and program impact. This approach, known as Result-Based Management (RBM), emphasizes planning, monitoring, and reporting on tangible results rather than merely tracking inputs and outputs.

The field of Computer Science, with its inherently measurable outcomes, is particularly suited for RBM. Despite this, many departments, including the case study for this project, continue to rely on outdated manual systems for processing and reviewing results. This project, therefore, focuses on developing a dedicated Result-Based Management System (RBMS) for students of the Computer Science Department at the University of Benin. The goal is to create a modern, automated platform for monitoring student academic performance and outcomes.

An RBMS represents a contemporary management strategy that leverages technology to track, analyze, and enhance student academic records. By automating the computation and storage of student data, this system enables tertiary institutions to monitor academic progress effectively and provide students with real-time access to their performance metrics.

Currently, the University of Benin employs fragmented processes for student result computation, leading to delayed transcripts, inaccuracies in GPA/CGPA calculations, and concerns over the security of student records. For instance, the manual calculation of a student's GPA/CGPA requires meticulous aggregation of credit units and grade points. A single data entry error can produce an inaccurate result, with serious implications for degree classification, probation status, or graduation eligibility.

The university employs a standard grading scale:

1. Grade 'A' (70% - 100%, 5 points): Excellent
2. Grade 'B' (60% - 69%, 4 points): Good
3. Grade 'C' (50% - 59%, 3 points): Acceptable/Average
4. Grade 'D' (45% - 49%, 2 points): Pass (Below Average)
5. Grade 'E' (40% - 44%, 1 point): Fail (No retake required)
6. Grade 'F' (0% - 39%, 0 points): Fail (Retake required)

Given the rapid advancement of technology, it is imperative for the University of Benin to adopt computerized systems that can accurately process and manage student academic results, ensuring integrity, efficiency, and transparency.

1.2 Statement of the Problem

The manual and semi-automated processes currently used for managing student results in the Computer Science Department are fraught with significant drawbacks:

1. The manual computation of results is highly prone to human error, leading to incorrect grades and CGPA, which directly impacts students' academic standing and future opportunities.
2. The existing system is slow and cumbersome, causing unnecessary delays in the release of student results. This hinders the department's ability to make timely, evidence-based decisions regarding student progression.
3. Manual record-keeping is vulnerable to loss, damage, and unauthorized alteration. This compromises the transparency and security of student academic data, potentially leading to disputes and a lack of trust in the system.

These identified problems form the core motivation for this research. This project investigates the current result processing and management framework within the Computer Science Department and aims to design and implement a computerized, web-based system capable of accurately computing, analyzing, and managing student academic results.

1.3 Aim and Objectives of the Study

This study aim is to develop a Result-Based Management System (RBMS) that is capable of automating the computation of results, performing analysis and giving reports on tertiary institution student academic performances, using the Computer Science Department in the University of Benin as a case study.

To achieve this aim, the following objectives will also be met:

1. To examine the existing system to identify and perform analysis on the various limitations in the current academic result computation process.
2. To design a web-based result management system that can compute the GPA/CGPA of students for each semester/session.
3. To reduce errors associated with manual result calculation processes.

4. To provide a user-friendly platform and also enable real-time access to both students and administrators.

1.4 Significance of Study

This project is very significant to the lecturers and administrative operations of the University of Benin and other tertiary institutions, helping them to be able to compute student results.

Therefore, eliminating the problems of using manual systems and also reducing the workload of the administrative staff.

This study provides students with real-time access to their result, thereby helping them make good academic decisions. The system improves data consistency, reduces error in result computation process and also reduces delay in the release of student results.

This study is also useful to researchers and non-researchers who want to expand their knowledge on this topic so that they can build more on their research work.

1.5 Scope of the Study

This study focuses on the development of a web-based result management system that is capable of managing the academic results of students by doing the computation, analysis and giving reports on the Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA), functionality for visual dashboards, and user roles (students, lecturers, departmental administrators) for the Department of Computer Science, University of Benin.

The system will not be able to deliver a full university-wide integration with all the legacy systems, beyond simple authentication, nor advance predictive analytics such as AI analytics or mobile application responsive web view due to the project timeframe.

1.6 Limitations of the Study

During the process of preparing this project, there were so many limitations that affected the completion of the project and also affected the addition of other features.

Some of which are the following:

1. Since the project is a web-based result management system, it depends on a stable internet.
2. Even though the system is scalable, it is also not integrated with other departments or faculties, but rather, limited to only the Computer Science Department.
3. The system excludes post-graduate records**.**
4. Difficulty in the collection of data from students and also limited access to departmental infrastructure.

1.7 Definition of Terms

1. **Tertiary Institutions:** These are educational institutions like universities, colleges of education, and polytechnics that provide higher education to students beyond the secondary level.
2. **Grade Point Average (GPA):** It's a numerical representation of a student's performance for each semester, and it's calculated by dividing the total grade points of the student by the total credit units for that semester.
3. **Cumulative Grade Point Average (CGPA):** This is the overall measure of academic performance of a student across multiple semesters or for a complete session. It's calculated just like the GPA, only that it is based on a complete session. It's mathematically calculated by dividing the total grade points earned by a student at the end of a session by the total credit units taken.
4. **Web-based Application:** It is a software that can be accessed through web browsers over a network such as an intranet or Internet.
5. **Dashboard:** This is a visual interface that displays key data in an organized and understandable format, allowing users to filter and sort data for more detailed analysis.

6. **Automation:** This is the use of modern technologies for the performance of various tasks with minimal human intervention.
7. **Real-Time Analysis:** This is the ability of systems to instantly process input data and respond quickly by providing immediate feedback.
8. **Scalability:** When a system can be adopted for use by other departments or institutions without any major changes in the capacity of the system, then the system is said to be scalable.
9. **Transcript:** This is a formal document showing a student's complete academic performance, such as grades, CGPA, and all courses taken by the student.
10. **User Interface:** This is the visual part of the system that users see and interact with. They include the tables, form, buttons, input fields, etc.
11. **Management:** It deals with the whole activities that have to do with directing, planning, and coordinating resources to achieve a specific goal.
12. **Integrated Development Environment (IDE):** This is a software application that provides a comprehensive set of tools that enables programmers to write, edit, and debug their code efficiently.
13. **Result-Based Management (RBM):** This is a management approach that focuses on achieving identified outcomes and uses performance information to plan and improve programs.
14. **Result-Based Management System (RBMS):** This is a software that support Result-Based Management (RBM) in collecting evidence and generating outcome reports. It's a system that integrates Student Information System (SIS) functionalities with Key Performance Indicator (KPI) to improve academic performance.

15. **Student Information System (SIS):** It's a software designed to manage and store student related data. They include personal details, student registrations, courses enrollment, etc.
16. **Key Performance Indicator (KPI):** This is a measurable value that shows how effective a student, department or even an institution is performing academically. It tracks progresses and helps in making guided decisions. Key Performance Indicators for students could be Grade Point Average (GPA), Attendance rate, Course completion rate, or Pass/fail ratio. While for institutions it could be Percentage of students graduating or dropout rate.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a comprehensive analysis of existing scholarly work and systems related to student academic result management. It begins with a global perspective before narrowing its focus to the context of Nigerian federal universities, specifically the University of Benin's Computer Science Department. The review critically examines the conceptual foundations of Result-Based Management (RBM), explores traditional and modern registration and result management systems, and highlights the benefits of digital transformation in academic administration.

2.1 Conceptual Framework

The conceptual framework explains the main concept of Result-Based Management (RBM) and how they relate with one another, its components, the role in the management of student results and also the benefits of computerization.

2.1.1 Result-Based Management

Result-Based Management (RBM) has evolved into a strategic framework for defining, managing, and measuring outcomes since its prominence in the 1990s. While some critics argue that RBM can become a bureaucratic exercise that diverts resources from core developmental work (Hatten & Schroeder, 2007), its core principle—shifting focus from activities to measurable outcomes—is transformative for educational management.

In the context of higher education, an RBM system must deliver reliable metrics, such as pass rates and average GPA, and support robust program evaluation. It encompasses the entire lifecycle of student result management—recording, processing, storing, and releasing—often through integration with subsystems like Student Information Systems (SIS) and Learning

Management Systems (LMS). As noted by the OECD (2019), RBM represents a disciplined approach to embedding performance measurement into organizational practice. Globally, this approach has been adopted to enhance accountability; for instance, Quebec, Canada, implemented performance-based accountability policies to strengthen its education system. UNICEF (2017) defines RBM as a strategic management approach that prioritizes the achievement of measurable and meaningful results throughout the lifecycle of educational programs.

2.1.2 Components of a Result Management System

For a system to function effectively, there must be several components that must be put together to make the system function properly. But these components have different functions and are meant to complement each other to make the system work well.

1. **User Interface (UI)/Front-End Component:** This is the part of the system which users sees and interact with. It includes features such as login page, data entry forms, result viewing dashboards.
2. **Data Storage Component:** This component deals with the storing of all academic information such as student records, course records, department information, assessment records. It is the backbone of the system supporting updates, backups, and data retrieval.
3. **Security Module:** It ensures only authorized users can access the system and also checks if the data inputted into the system is accurate.

   They include features like logging (i.e., every changes made), audit reports (i.e., who change what, when, and from where was the change made), user accounts (unique IDs, passwords).
4. **Reporting Module:** This module helps in the generation of reports and produce summaries that help in academic review. It includes features like automatic transcript generation, departmental course summary sheets.

5. **Application Layer:** This is the part of the system that does the processing of raw data into meaningful reports by following predefined rules. It includes features like CGPA and GPA calculation, access control (i.e., what users can do such as lecturer upload results).

2.1.3 What is a Result?

A result is a measurable change in state obtained from a specific action or activity. It focuses on "What is achieved?" rather than "What is done?"

Results are used by result based management to plan, monitor and evaluate progress, making sure resources are effectively contributing to desired goal.

Result-Based Management (RBM) for students can be viewed from three dimensions:

1. **Academic Dimension:** Academically, result talks about those tangible outputs that are produced by result-based management systems. Example: student GPAs, overall academic standings and grades.
2. **Managerial Dimension:** This talks about the improvement in how efficient and effective the department or administrative staff manages student records.
3. **Strategic Dimension:** This focuses on the impact the result-based management system creates on the institution that adopts it. Examples: The rate at which students complain has now reduced due to adoption of the result-based management system.

A result should be (SMART):

1. **Specific (S):** A result should be stated clearly and focused on what is expected to change and who or what will be affected by the effect of the change. My project clearly states the "What" (Design and Implementation of a Result-Based Management System) and "Where" (Computer Science Department) of the system.
2. **Measurable (M):** Results must be measurable, so that progress can be tracked in order to know when goal have been achieved. Here, you ask questions like "Can I find a performance indicator that can tell about the level of achievement".

3. **Achievable (A):** Results must be realistic and achievable with the human effort and resources available. Here, you ask questions like “Do I have enough resources to attain the expected result?”.
4. **Relevant (R):** Results should respond to the overall objectives and values.
5. **Time-bound (T):** Results should be obtained within a specific set time-frame.

2.1.4 Analysis and Interpretation of the Approaches and the Result

The analysis shows that the Result-Based Management System (RBMS) improved the result processing accuracy, reducing administrative workload and enhanced transparency, though continuous policy support is needed to sustain and scale these improvements.

The interpretation shows that even though outputs were fully achieved through Result-Based Management System (RBMS), the outcomes still depends on the user’s adoption and institutional support.

One distinguishable feature of Result-Based Management (RBM) is the result chain.

Result chain is a visual or logical model that shows the sequence of steps from inputs through activities to outputs, outcomes and impacts in a project or program.

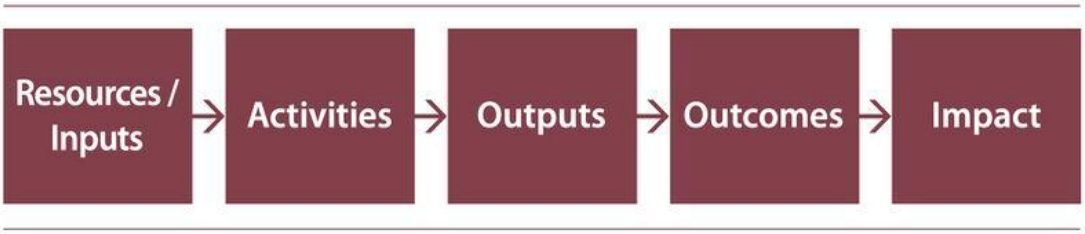

Figure 2.1- Result Chain (Kim Jackson, 2020)

Table 2.1 A Graphical Representation of the Hierarchy of Result:

Level	Time Frame of Results	Description	Example in my system
Input	Immediate	What resources are used?	Software tools, Student data, Developer time
Activity	Immediate	What is done?	Designing and writing codes for the system
Output	Short-term	What is produced or delivered?	Functional result-based management system (RBMS)
Outcomes	Medium-term	What short-to medium-term effect/changes do we need to achieve?	Improved accuracy and accessibility in result
Impact	Long-term	What long-term changes are we aiming for?	Enhanced transparency in student academic record

2.1.5 Result-Based System in Nigerian Federal Universities

Many Nigerian federal universities still use traditional/manual methods like paper-based record and spreadsheets alongside online portals for result management. This has been one of the major problems in most Nigerian federal universities. This method depends on manual entry of data, extensive paperwork, and it also requires a lot of time for verification processes, therefore, leading to errors, inconsistencies and also delay in the release of student results. The University of Benin's Computer Science Department, have struggled with manual result

processing systems and these methods are prone to errors, delay in results release and data inconsistency.

2.1.6 Problems Student Encounter with Manual Result Computation

There are numerous challenges faced by students when academic results are computed through paper-based records and spreadsheet software like Excel**:**

1. Students transferring from one department to the other experience delay in getting their transcript and it takes time before they are processed. This is even done only on request by the students.
2. Paper-based record requires manual entry of data and it is highly prone to human error, thereby resulting in incorrect grades and affecting students, academic standings.
3. Sometimes students have their own idea of what their final result should be only to be disappointed due to computational error during manual processing.
4. The delay in result release prevents students from promptly assessing their performance and making timely academic decisions.

2.1.7 Student Grade Point

Grade Point Average (GPA) is the representation of students overall academic performance numerically across all courses and it's calculated by averaging the grade points earned for all completed courses.

In the University of Benin, the Computer Science Department uses the letter grade system (A, B, C, D, E, F) to assign a percentage score range from 0% to 100% to students after the completion of their examination, which corresponds to a numerical value on a 5.0 rating scale where: First Class is 4.50-5.00, Second Class Upper is 3.50-4.49, Second Class Lower is 2.50-3.49, Third Class is 1.50-2.49, and Pass is 1.00-1.49.

The Grade Point Average can be calculated per semester, per session or can even be cumulative when it's used to reflect on all the courses taken by students all through their academic career.

Grade Point Average is a very powerful tool that summarizes student's academic achievement and also determine their academic standings, which influences their eligibility for scholarships, honours, admission to further education and class rankings.

The final computation of results has the formula:

Grade point $=$ $\text{credit unit (per course)} \times \text{point}$

Grade point average $= \dfrac{(total\ grade\ point)}{\text{(Total credit units)}}$

Cumulative grade point average $= \dfrac{\text{(cumulative total grade point)}}{\text{(Cumulative total credit units)}}$

Table 2.2: A Standard Rating of the Scores and Grades Endpoint

Score range %	Grade
70-100	A
60-69	B
50-59	C
45-49	D
40-44	E

0-39	F

At the end of the above calculation, a class of degree is then awarded to a graduating student through the Final Cumulative Grade Point Average (FCGPA) as follows;

FCGPA	CLASS OF DEGREE
4.50-5.00	First Class Honours
3.50-4.49	Second Class Upper Honours
2.50-3.49	Second Class Lower Honours
1.50-2.39	Third Class Honours
1.00-1.49	Pass

2.2 Concept of Registration

This is the foundation for academic records. It is the first step that ensures students are properly admitted into institutions, courses are balanced, and also ensures that academic processes run effectively. Registration is usually carried out by the registrar. A registrar in any academic institution is an official who deals with the handling of student records. They process all registration request, schedule classes, maintains class list and also keep permanent record of student grades.

In the United Kingdom, the term registrar is usually used for the head of the university's administration. The role is usually combined with that of secretary of the university's

governing bodies and in these cases, the full title will often be "registrar and secretary" (or "secretary and registrar") to reflect these dual roles.

The University of Cambridge in England uses the archaic spelling of "Registrary" for this office (Samuel, 2010).

In Nigerian universities, registration is a formal process that enrols students into their academic courses for a session. It is the only checkpoint that verifies that a student meets the admission requirements of that university before properly recording that students into the academic system.

Registration in the University of Benin usually begins after admission, where fresh students undergo various screening processes to confirm eligibility. These processes include payment of acceptance fee, providing all sort of documents such as: Admission letters (both JAMB and UNIBEN), Affidavit of good conduct, State of origin, Non-membership of cultism, and verification of academic credentials.

Effective registration secures proper documentation of student academic records, examination eligibility and proper course enrolment. Yet, this depends on the institution, because various institutions have their own method of registration. The University of Benin still rely on manual method of registration even though they use online registration.

2.2.1 Manual Registration

Manual registration is a traditional process where students have to physically visit the institution for the purpose of enrolling in a course or program in that institution. This method requires manual entry of data by administrative staffs and this can be prone to errors, wrong data entry, loss of student forms and it’s also slower in communication.

In 1990, registration was done manually in almost all tertiary institutions in Nigeria. Students collect registration forms from either the registry, departmental offices or faculty offices.

They fill in the necessary information and move from one office to the other for the signing of such forms.

Students are seen parading with registration forms, while lectures are ongoing in their class. These forms can be torn even before the completion of their registration. Students are usually frustrated because of the long queues they have to wait for the signing or collection of their form. In a case of bad weather condition such as in raining season, these forms could be damaged by rain if not properly kept by either the student or even the registry.

Students have a better orientation of their tertiary institution when they actively involve themselves in manual registration (Akinde, 2004).

The manual method of registration is still beneficial to students even though it's a traditional process of verifying that a student meets the requirements of an institution. Students are able to identify the offices of their lecturers easily.

Manual course registration is part of the orientation program for every student, it will enable them have a better understanding of their environment (Oni, 2011).

Overall, shifting from manual to online registration will broaden the digitalization of educational system to enhance administrative effectiveness and student experience.

2.2.2 Online Registration

Online registration is a digitalized system that is accessible through internet platforms with the purpose of making registration processes such as program or course enrollment easy and faster for students in a tertiary institution.

Online registration is a recent technology in school administration. Before the advent of on-line registration, students were faced with various problems of manual registration, where students were faced with all manner of intimidation and wrong attitude from staff who are supposed to sign such forms.

Apart from the fact that there are several reported cases of sexual harassment among students and lecturers, the clerical staff and other administrative staff often use the deadline placed on submission of forms to harass and extort money (Ojo, 2013).

Online registration has put an end to all manners of complaints by students about the nonchalant attitude of some staff in signing course forms (Ajayi, 2004).

The Nigerian academic calendar is most unpredictable. Strike actions could be taken any time leading to the staying out of offices by academic and non-academic staffs for several days, weeks or months, thereby, making it impossible for students to do their registrations within the set time. This often result to rush and in the process so many forms are misplaced.

With online, registration could still be on even when tertiary institutions are on strike. It is more convenient especially for those who live in urban centres with all the internet facilities present.

Online registration allows quicker response (Ademilokun, 2004).

A well designed student record system allows for timely retrieval of the needed information concerning any student. With just a push of a button, the needed information that could guide decision making are easily retrieved.

2.2.3 Web Portal in Tertiary Institutions

A web portal in tertiary institutions is a centralized platform that brings information from diverse sources, like emails and online forum to users like students in tertiary institutions with the ease of accessing a wide range of academic, administrative and social services through a single interface.

The role of the user in an institution may determine which content can be added to the portal or deleted from the portal configuration (Seyle, 2014).

The idea of the web portal is to provide users (in this case students) with information from various sources (that is, systems or servers) within a single web page. All the important

functions on a web portal are carried out by application servers, which are connected to the database servers (used for the storing of student's information or databases).

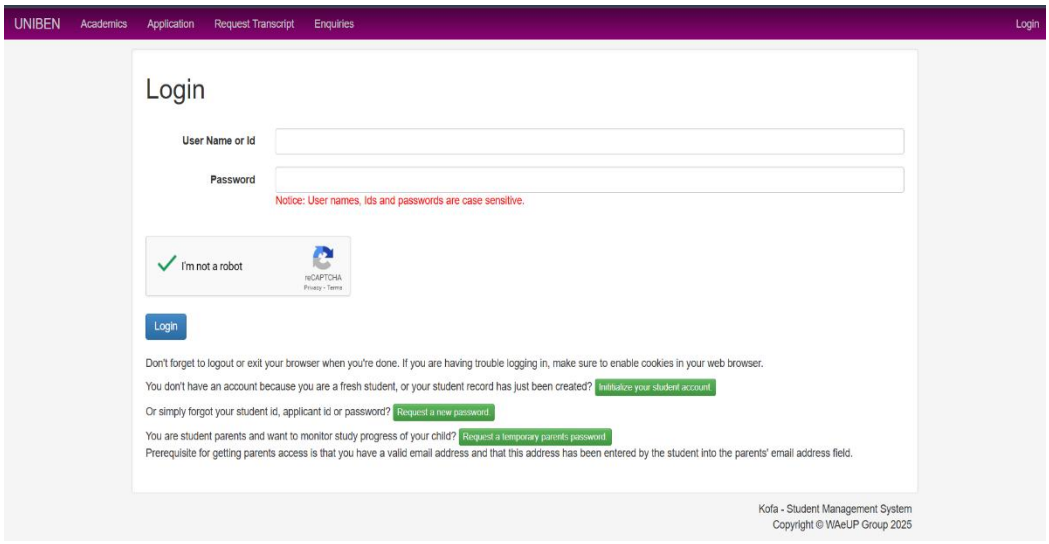

Figure 2.2- University of Benin Student Portal

2.2.4 Challenges of Web Portals in Tertiary Institutions

Even though, portals offer huge benefits, tertiary institutions must look for a way to navigate all through the technical, financial, and human challenges in order to increase their value. These challenges include:

1. **User Experience Issues:** Some tertiary institution portals are poorly designed interfaces, lack mobile and desktop responsiveness, inadequate accessibility features which has made users (students or administrative) to become frustrated when they use the portal.
2. **Maintenance and Technical Support:** Institution might struggle with funding or retaining the qualified staff to maintain the portal. Due to this financial constraint the portal may not be maintained for a period of time thereby, leading to some functionality problems such as breaching of student's data and glitch in fee payment.

2.2.5 Benefits of Web Portals in Tertiary Institutions

Many tertiary institutions are now beginning to implement web portals into their academic system. This practice has led to a number of benefits:

1. **Improved Communication:** Portals have greatly improved the communication among students, administration, and faculty through mediums of direct messaging, forums, and announcement thereby reducing the issues of delays.
2. **Centralized Access:** Portal is a platform that is used by various tertiary institutions to unify multiple services such as fee payment, course registration, and examination result checking all in one platform.
3. **Support for Remote Learning:** Portals enable access to online courses, virtual libraries, submission of assignments, remote examinations, and also support remote learning especially in post-pandemic crisis. During the COVID-19 pandemic in mid-2020, University of Lagos (UNILAG) did use remote learning through its learning management system (LMS).

2.2.6 Merits of Integrating Databases in Web Applications

Implementation of database in web grade point computation application offers a number of benefits over the use of a manual system. They include:

1. Database are designed to store information in a structured manner, therefore reducing multiple copies of same student record.
2. Database management systems provides backup and recovery features which helps to secure and backup data and also used for data recovery in case of system crash.

2.3 Related Works

Table 2.3: Relevant Literature Works

Year	Authors	Objectives	Methodology	Results	Limitations
2020	Ajayi et al.	Develop a hybrid office /web-based result management system for Nigerian tertiary institutions.	Participatory Incremental Process model; PHP/HTML/CSS/MySQL; departmental case study.	Automated result computation and reduced manual processing errors.	Limited scalability and hosted locally.
2021	Zaman et al.	compared architectural designs for student result management systems.	Survey analysis and Agile development recommendations.	Standard modules identified: registration, grade management, and reporting.	Descriptive study with limited empirical evaluation.
2023	Rainy (Quest Journals)	Review benefits/challenges of student result management and propose a prototype application.	Literature review and system design using MySQL database.	Improved efficiency and reporting timeliness in managing student performance data.	Lacks empirical testing and real-world performance evaluation.
2023	U.A. Bello (IJFMR)	Automate result computation and transcript generation to minimize manual workload.	Structured Systems Analysis and Design Methodology (SSADM); implemented in VB and MS Access.	Reduced errors and streamlined transcript generation process.	Desktop-based; lacks web scalability and concurrent access features.
2024	IJCRT Authors	Survey of student result management systems and development of a scalable web-based prototype.	Agile development with PHP/MySQL backend; literature synthesis.	Faster result processing and improved architecture for scalability.	Prototype not evaluated for security or full deployment scenarios.
2024	M. Ohini	Provide online result checking portal for students and administrators.	Web-based design using CSS, JS, PHP, and MySQL.	Improved accessibility and usability for student result checking.	Prototype-level project; lacks extensive testing on security and

					performance.
2023	A. Bala	Integrate biometric verification to enhance result integrity and prevent impersonation.	Prototype combining biometric module with student result database.	Improved data integrity and authentication reliability.	Increased cost and integration complexity with institutional systems.
2025	V.A. Ugonna	Assess record management practices in open university systems and recommend improvements.	Qualitative interviews and document analysis.	Identified challenges in digital record keeping and recommended standardization.	Institution-specific findings; lacks technical implementation details.

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.0 Introduction

This chapter details the systematic procedures employed in the analysis and design of the proposed Result-Based Management System (RBMS). It outlines the transition from identifying user requirements to creating a structured blueprint that guides the system's development. The primary objective is to ensure the final product aligns with the project's aims and effectively addresses the needs of its end-users.

3.1 Analysis of the Existing System

A thorough system analysis was conducted to deconstruct the existing manual processes for Comprehensive Grade Point Average (CGPA) computation at the University of Benin. This investigation revealed a system heavily reliant on paper records and spreadsheet applications, which has been in use for many years. The analysis identified critical inefficiencies related to accuracy, operational speed, and data accessibility inherent in these traditional methods.

The manual approach to processing and generating student results is not only slow but also demands considerable human effort from lecturers and Heads of Department. More importantly, it is highly susceptible to errors, which can lead to the production of inaccurate student results. A robust system analysis must not only pinpoint these problems but also establish a clear framework for a solution, ensuring the proposed system is thoroughly aligned with user requirements.

3.1.1 Problems of the Existing System

The following weaknesses of the existing system are:

1. **Time-Consuming Processes:** The manual computation and preparation of student Grade Point Averages (GPA) is a laborious task, leading to considerable delays when processing results for an entire department.
2. **Prone to Errors and Inaccuracies:** The reliance on manual data entry and calculation frequently results in computational and transcriptional mistakes, compromising the integrity of the final results issued to students.
3. **Data Vulnerability:** Physical result sheets and digital spreadsheets without robust access controls are vulnerable to loss, damage, or unauthorized alteration, posing a serious risk to the security of sensitive academic records.
4. **Lack of Scalability:** The manual system becomes increasingly difficult and cumbersome to manage as the student population grows each academic year, highlighting its inability to scale effectively.

3.2 Overview of the Proposed System

The proposed system is a Result-Based Management system which is designed to solve the problems of inefficiencies and limitations of the existing system that is used in Computer Science Department of the University of Benin.

The proposed system has an additional feature which enables the addition of students details by the HODs and Lecturers, therefore, reducing the workload of school administrative and teaching staffs.

An overview of the proposed system flow chart has a relationship between an object to another just like the Entity Relationship diagram (ERD). The primary purpose of ERD is to represent the relationship between data object.

The proposed system will serve as a centralized platform that manages students result from data entry, computation, ensuring accuracy, transparency, and timely access for both staffs and students.

3.2.1 Benefits of the Proposed System

The implementation of the RBMS is expected to yield numerous benefits:

1. **Enhanced Management Efficiency:** The system provides a computerized package for student grade point computation, streamlining a critical administrative function.
2. **Increased Processing Speed:** It dramatically accelerates the rate of computing grades and scores, eliminating the labor-intensive aspects of manual record-keeping.
3. **Improved Accuracy:** By automating calculations, the system minimizes computational, human, and transcription errors.
4. **Faster Result Publication:** The entire process from result entry to student access is expedited.
5. **Universal Accessibility:** As a web-based system, it can be accessed by authorized users (students and lecturers) from any location with an internet connection.
6. **Scalability:** The system's design allows for future expansion to other departments or even other tertiary institutions.

3.2.2 Features Implemented on the Proposed System

1. **Separate Dashboards:**
    i. Admin dashboard (manage student result).
    ii. Student dashboard (view results, calculate CGPA).
2. **Responsive Design:**
    i. The proposed system works on all screen sizes.
    ii. Adaptive layout with collapsible sidebar for smaller screens.

3. **Admin Features:**
    i. Manage student results
    ii. Result computation (add/remove)
4. **Student Features:**
    i. Update profile information
    ii. View results

5. **CGPA Calculator:**
    i. Real-time calculator with visual display
    ii. Calculator with add/remove feature functionality.

3.3 System Requirements

System requirements talks about the specifications and resources that must be provided for a system to function effectively in order to achieve its objectives.

In my project it describes the expected operational and technical features, functionalities, and performance criteria of the system been developed.

3.3.1 Functional Requirements

These requirements describe what the software has to do and they are referred to as the product features. They include:

1. The system shall allow administrators to authenticate and log in to manage student results.
2. The system shall allow students to log in using unique identifiers to view their results once uploaded.
3. The system shall automatically calculate the GPA and CGPA for students based on inputted scores and credit units.

4. The system shall securely store and manage all student-related information, including personal details and academic records.

3.3.2 Non-Functional Requirements

This aspect talks about the quality of the software and how the software will work.

They include:

1. **Performance:** The system shall be capable of handling a large volume of student records and respond to most user interactions within 2 seconds.
2. **Security:** User passwords shall be encrypted, and the system shall implement access control mechanisms.
3. **Reliability:** The system shall include automatic backup procedures to prevent data loss.
4. **Usability:** The interface shall be intuitive and user-friendly for both administrators and students.

3.3.3 Minimum Hardware Requirements

This talks about the lowest physical computer specification needed for a system to install, run, and perform its operations efficiently and effectively without crashing. They include:

1. Intel core i3 or higher

2. 4GB RAM or more

3. 250GB Hard Disk Drive (HDD) minimum

3.3.4 Minimum Software Requirements

This talks about the basic software platforms, tools, and applications that must be installed for the system to carry its operations efficiently. They include:

1. The development of this system requires an operating system (Windows 10 or any other type of your choice)
2. Server: XAMPP (MySQL)

3. Database (MySQL)
4. Browser (chrome, Microsoft Edge)
5. Programming languages (HTML, CSS, JavaScript)
6. Integrated Development Environment (Visual Studio Code)

3.4 System Design

System design involves the transformation of those user requirements into a blueprint used in the actual development of the system. This is the phase of the project where we convert those theoretical ideas and requirements that were gathered into a structured blueprint that shows exactly how the proposed system works.

The proposed system will adopt a 3-tier layer architecture:

1. **Presentation Layer:** This is the Frontend part of the system. They include the student dashboards and form registration.
2. **Application Layer:** This serves as the Backend of the system, dealing with all computation of students results and user authentication.
3. **Data Layer:** This serves as the database of the system, storing students courses and results

3.4.1 Data Flow Diagram of the Proposed System

This diagram shows how data flows within the proposed system showing the inputs, output, processes and how students data are being stored.

1. **External Entities:** Admin and Student.
2. **Processes:** Registration, Login, Result Management, CGPA Calculation.
3. **Data Stores:** Admin Table, Student Table, Grade Point Records.

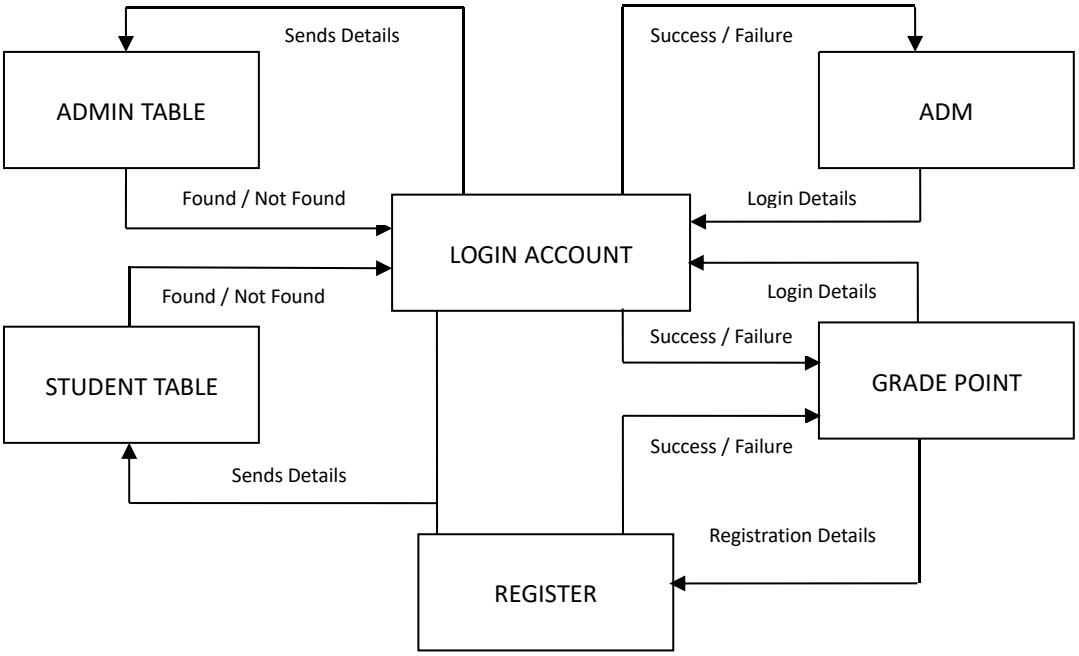

Figure 3.1- Data Flow Diagram of the Proposed System

3.4.2 Unified Modeling Language (UML) Modeling

UML is a visual modeling language used in software development to represent, and show how the various components of a system behaves before implementation. The UML used in this project includes: use case diagrams.

3.4.3 Use Case Diagram of the Admin/Users

A use case diagram illustrates in a very simple way the functions of the system and the different kinds of users (admin, student) who will interact with it.

1. **Admin Use Cases:** Include managing student results, computing GPA, and activating/deactivating accounts.
2. **Student Use Cases:** Include viewing results, calculating CGPA, and updating profile information.

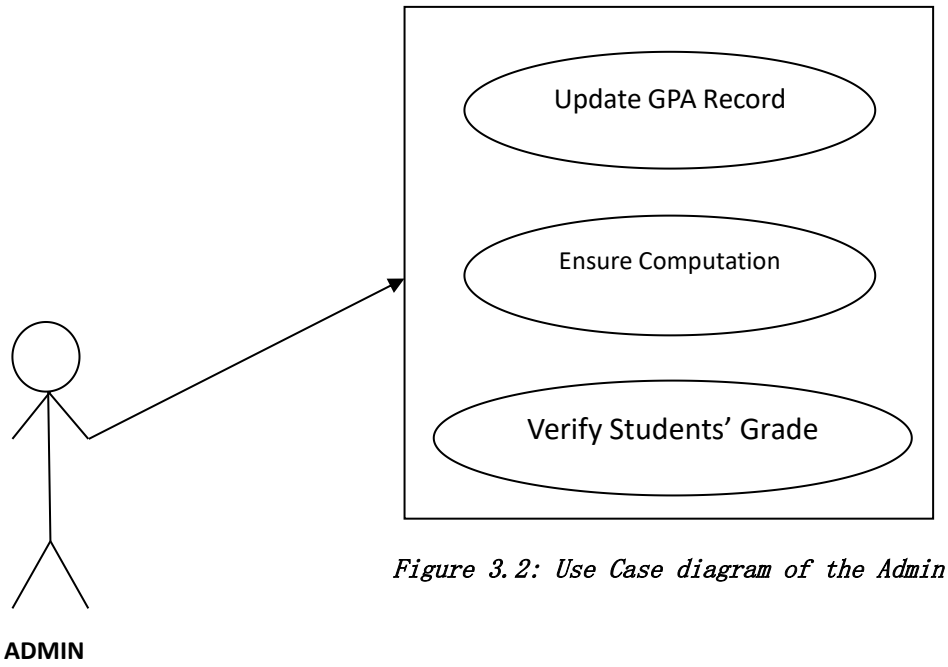

Figure 3.2: Use Case diagram of the Admin

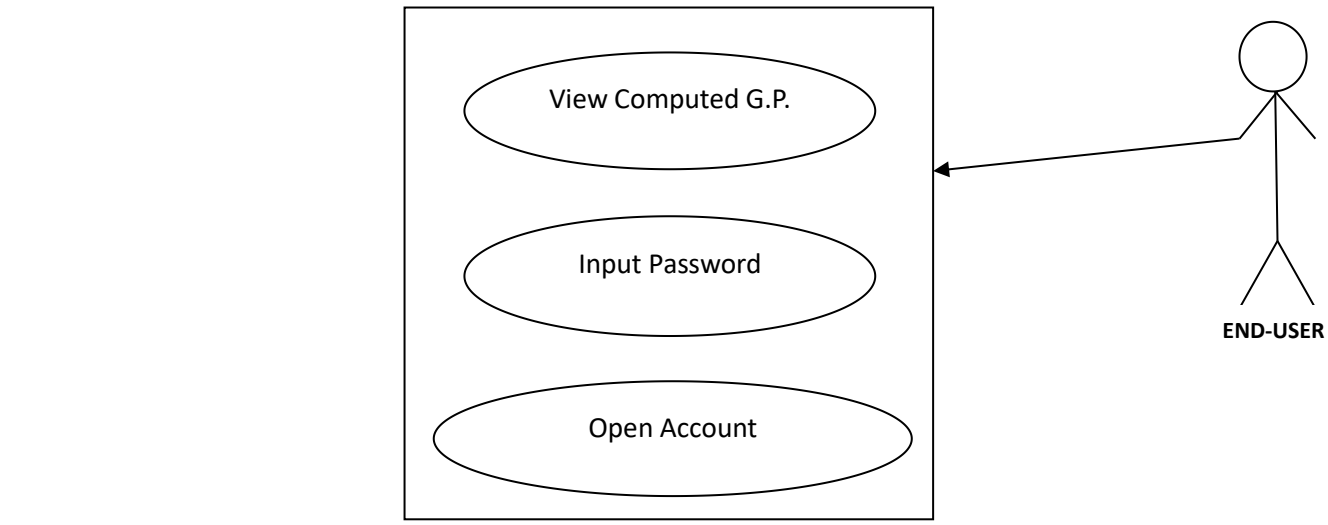

Figure 3.3: Use Case diagram of the User

3.4.4 Database Design

Database is critical for all businesses. A good database does not allow any form of anomalies and stores only relevant information in an ordered manner. If a database has anomalies, it is affecting the efficiency and data integrity.

The database serves as the storage for all student, course, and result-related data, ensuring data consistency and integrity.

The core of the system's data structure is built upon two primary tables:

1. **Student Table:** Stores student demographics, login credentials, and academic records.
2. **Admin Table:** Stores administrator account details and access privileges.

For the database of this project, the tables are normalized to Boyce-Codd Normal Form (BCNF) as shown in the table below:

Table 3.1: Student Table Index

#	Name	Type	Collation	Attributes	Null	Default
1	id	int(10)		UNSIGNED	No	*None*
2	surName	varchar(191)	utf8mb4_unicode_ci		No	*None*
3	firstName	varchar(191)	utf8mb4_unicode_ci		No	*None*
4	faculty	varchar(191)	utf8mb4_unicode_ci		No	*None*
5	department	varchar(191)	utf8mb4_unicode_ci		No	*None*
6	pin	varchar(191)	utf8mb4_unicode_ci		No	*None*
7	passport	varchar(191)	utf8mb4_unicode_ci		No	avatar.png
8	cv	varchar(191)	utf8mb4_unicode_ci		Yes	*NULL*
9	designation	varchar(191)	utf8mb4_unicode_ci		Yes	*NULL*
10	address	varchar(191)	utf8mb4_unicode_ci		Yes	*NULL*
11	email	varchar(191)	utf8mb4_unicode_ci		No	*None*
12	dob	varchar(191)	utf8mb4_unicode_ci		Yes	*NULL*
13	password	varchar(191)	utf8mb4_unicode_ci		No	*None*
14	remember_token	varchar(100)	utf8mb4_unicode_ci		Yes	*NULL*
15	created_at	timestamp			Yes	*NULL*
16	updated_at	timestamp			Yes	*NULL*

Table 3.2: Admin Table Index

#	Name	Type	Collation	Attributes	Null	Default
1	course_code	varchar(191)	utf8mb4_unicode_ci		No	*None*
2	course_title	varchar(191)	utf8mb4_unicode_ci		No	*None*
3	dept_name	varchar(191)	utf8mb4_unicode_ci		No	*None*
4	created_at	timestamp			Yes	*NULL*
5	updated_at	timestamp			Yes	*NULL*
6	deleted_at	timestamp			Yes	*NULL*

CHAPTER FOUR

IMPLEMENTATION AND TESTING

4.0 Introduction

This chapter documents the practical realization of the proposed Result-Based Management System (RBMS). It covers the system's development lifecycle, from its design objectives and architectural models to the selection of programming tools, implementation strategies, and the testing protocols employed to validate its functionality, accuracy, and reliability.

4.1 Objectives of the Design

The core design objective was to develop a fully functional, user-friendly, and efficient Result-Based Management System that automates the calculation, storage, and retrieval of student academic results. The specific design goals were:

1. To critically analyze the existing manual system, identifying its shortcomings to inform the design of a superior computerized solution.
2. To engineer a GPA computation system that serves as a reliable digital tool for managing student grade points, replacing error-prone manual methods.
3. To alleviate the administrative burden associated with repetitive and tedious result computation tasks, thereby enhancing departmental productivity.

4.2 Cohesion and Decomposition High-Level Model

The RBMS was architected using a modular approach, emphasizing high cohesion and functional decomposition. This means the system was broken down into smaller, self-contained modules where each component has a single, well-defined purpose (high cohesion). This design philosophy simplifies maintenance, understanding, and future enhancements.

Cohesion talks about the closeness of the system components, while decomposition talks about how the system’s component are broken into smaller, manageable components.

The decomposition is visualized through privilege diagrams for the two main user roles:

1. **Admin Privileges:** Encompass updating GPA records, ensuring computation accuracy, and activating or deactivating student accounts.
2. **Client (Student) Privileges:** Include account opening, CGPA verification, viewing grade points, and providing system feedback.

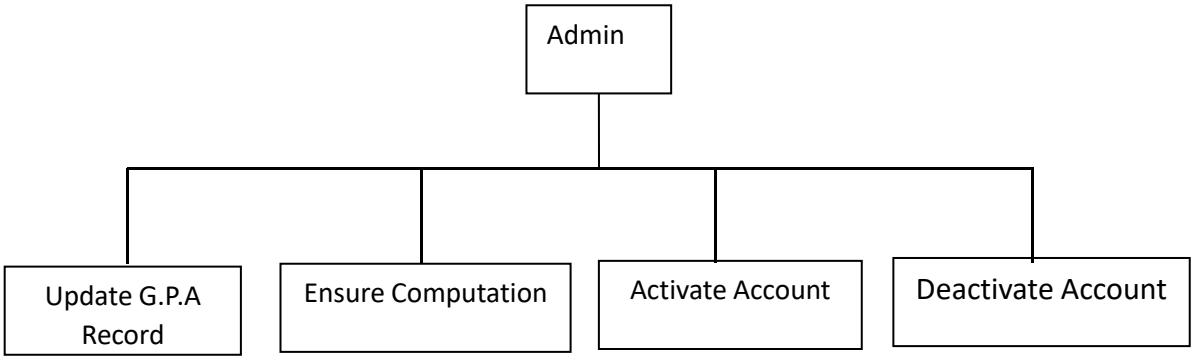

Figure 4.1: Admin User Privileges

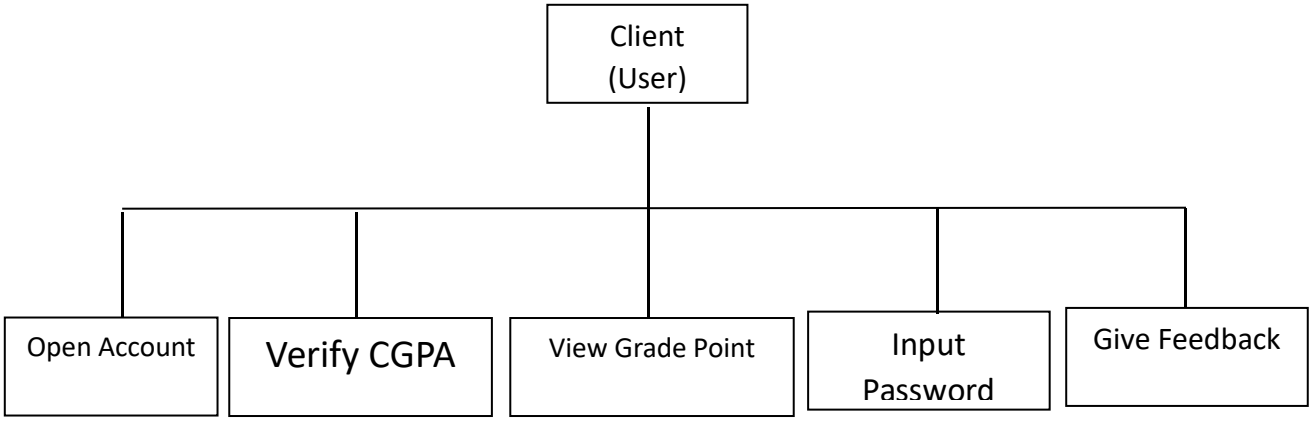

Figure 4.2: Client (User) Privileges

4.3 Overall Data Flow Diagram

Data flow diagram shows how information flows between system entities (users and processes). It ensures the smooth flow of data from the input to output.

1. **Level 0 DFD (Context Diagram):** Identifies the external entities (Students, Administrators), the central process (the RBMS itself), and the data stores (student records, grades).
2. **Level 1 DFD:** Breaks down the central process into sub-processes:
    i. Students register and log in to request their result data.
    ii. Lecturers input student marks, which the system then uses to compute grades.
    iii. Administrators verify data and generate various academic reports.

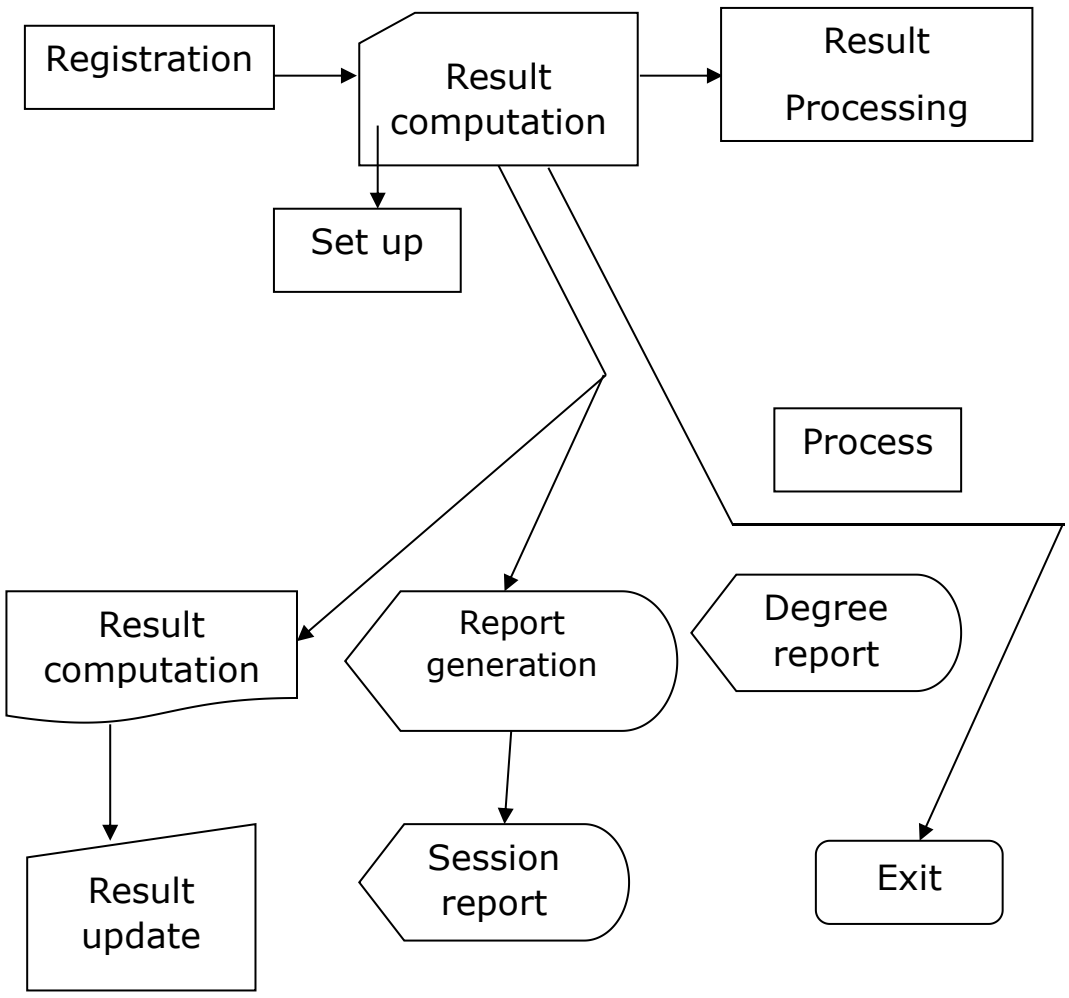

Figure 4.3: Overall Data Flow Diagram

4.4 Proposed System Operation Flow Chart

The system operation flow chart shows the step-by-step logic for a key process, such as a student accessing their results. The typical workflow is as follows:

1. The student enters their unique Student ID.
2. The system validates the ID against the database.
3. If valid, the student may be prompted for a password or security questions.
4. If the authentication is successful, the system retrieves and displays the student's grade point information.
5. If the ID is invalid or authentication fails, an appropriate error message is displayed.

This structured flow ensures secure and controlled access to sensitive academic information.

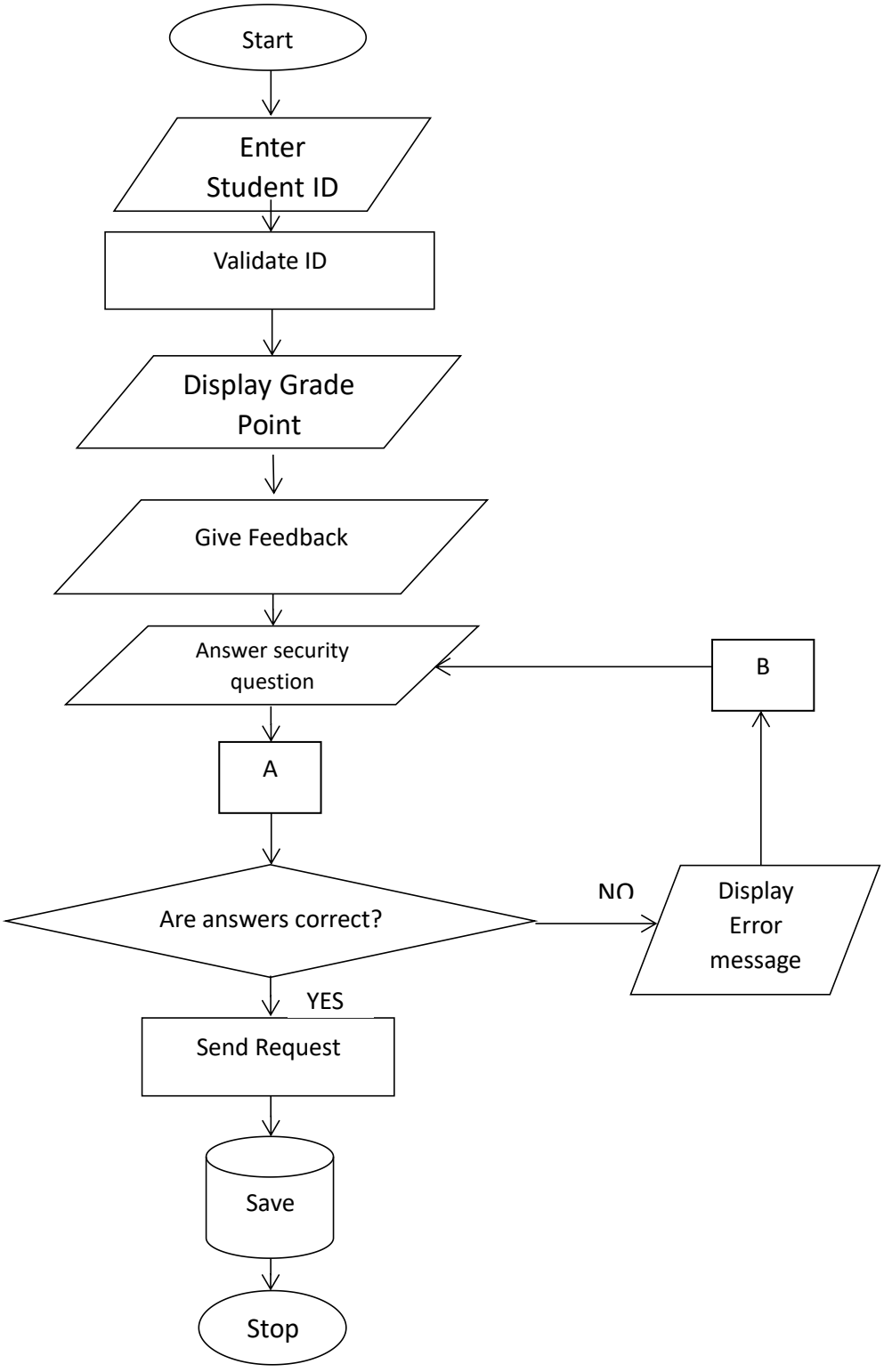

Figure 4.4: Proposed System Flow Chart

4.5 Input Specification

The system is designed to accept a range of structured inputs through its web interface:

1. **Student Information:** Name, Matriculation Number, Department.
2. **Course Details:** Course Code, Course Title, Credit Units.
3. **Assessment Scores:** Examination scores, test scores.

These inputs are captured via customized forms, such as the login page which requires a Student ID and Password.

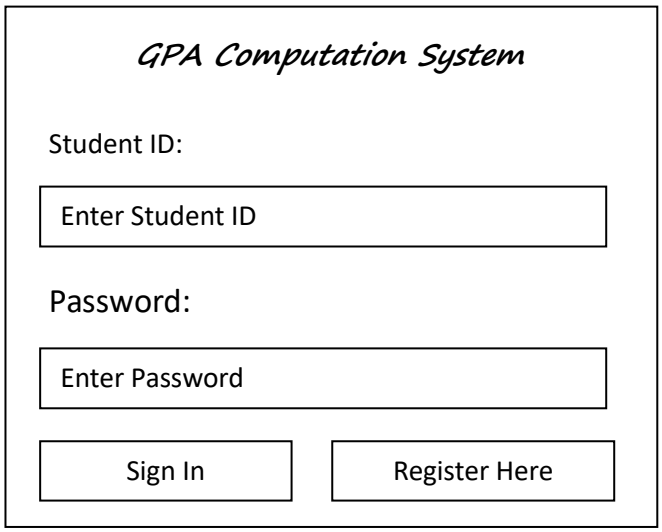

Figure 4.5: Input Specification

4.6 Output Specification

The system generates clear and organized outputs, primarily displayed on the web interface with options for export or download (e.g., as PDFs). Key outputs include:

1. Individual student result sheets detailing courses, credits, and grades.
2. Printable result slips for official use.
3. Comprehensive class summary reports for administrative review.

An example output is a tabulated result slip showing course codes, titles, credit units, and the awarded grades.

Table 4.1: Output Specification

S/No	Course code	Title	Credit Units	Grade
1	GNS 101	Use of English	2	A
2	GNS127	Citizenship education	2	B
3	Stat 111	Introduction to stat	2	C
4	Csc 111	Introduction to computer	2	A

4.7 Choice and Justification of Programming Language

The motive behind the use of the language is its compatibility with several Operating Systems. It is object oriented and combines the feature of hypertext Preprocessor (PHP) and JavaScript platform thereby making it to run on any Operating System. To ensure a standardized object oriented program, HTML, CSS, JAVASCRIPT, PHP and MYSQL Database was used in the development of Result-Based Management System.

The core tech stack includes:

1. HTML, CSS, JavaScript (jQuery): For creating a dynamic, responsive, and interactive user interface.

2. PHP: As the server-side scripting language, chosen for its strong integration with MySQL, extensive community support, and suitability for rapid web application development.
3. MySQL: As the relational database management system, selected for its reliability, performance, and seamless compatibility with PHP

4.8 Implementation Techniques

The software Implementation is a process carried out to make changes on the tested programs developed in the system. The software implementation was executed in distinct phases:

1. **Coding:** The system was coded to fulfill the primary objectives, focusing on developing a comprehensive and accurate GPA/CGPA computation engine.
2. **Changeover Procedure:** A plan was formulated for transitioning from the old manual system to the new RBMS. This involves data migration, user training, and a parallel run phase to ensure a smooth and error-free switchover.

4.9 Result and Discussion

A partially functional prototype of the Result-Based Management System was successfully developed. The backend is powered by a MySQL database, which stores all information pertaining to the RBMS, while the frontend and application logic were implemented using JavaScript, jQuery, and PHP.

The system's interface is demonstrated through the following sample screenshots:

1. **Admin/Student Login Page:** A unified login portal where users authenticate based on their role.

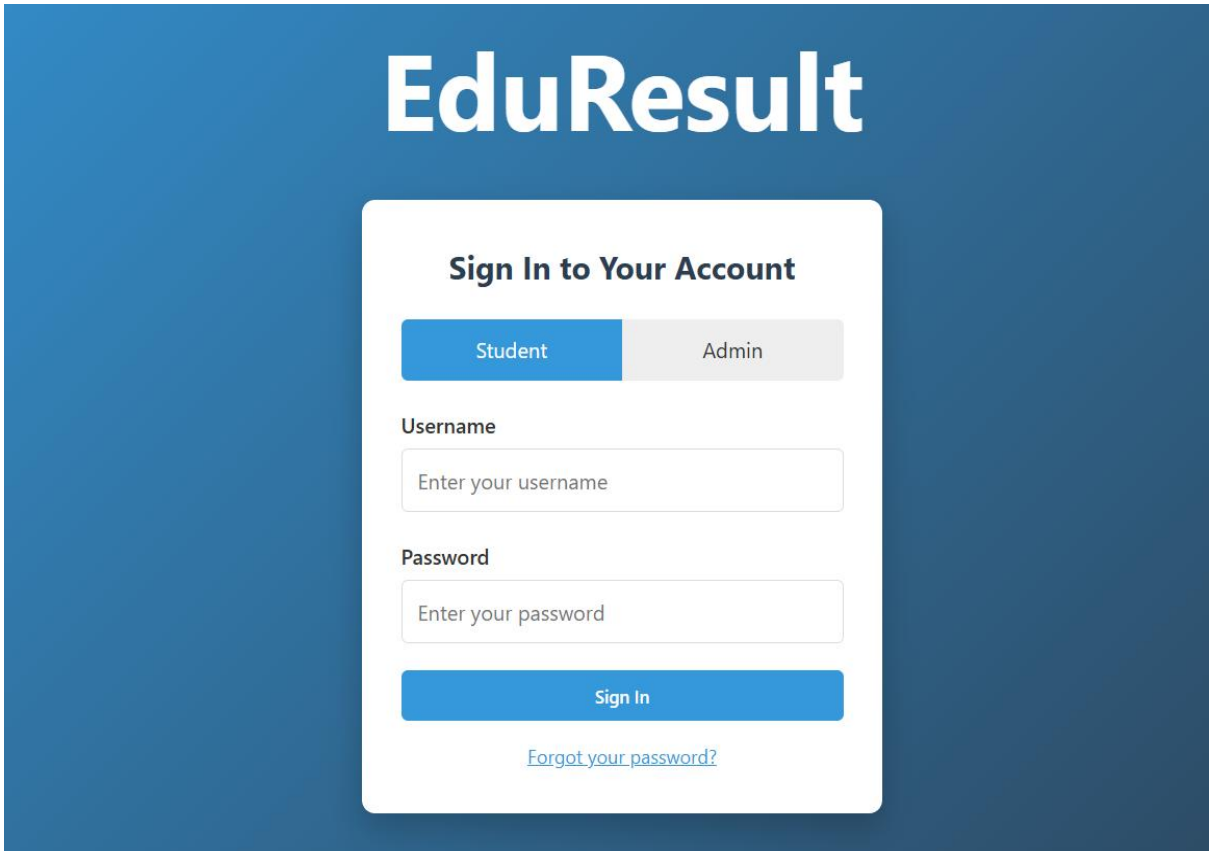

Figure 4.6: Admin/Student Login Page

2. **Admin Dashboard:** The central admin interface, providing access to all administrative tasks such as student and result management.

   This is the dashboard when an admin has successfully logged in. All the various tasks that can be performed by the admin is shown on this page:

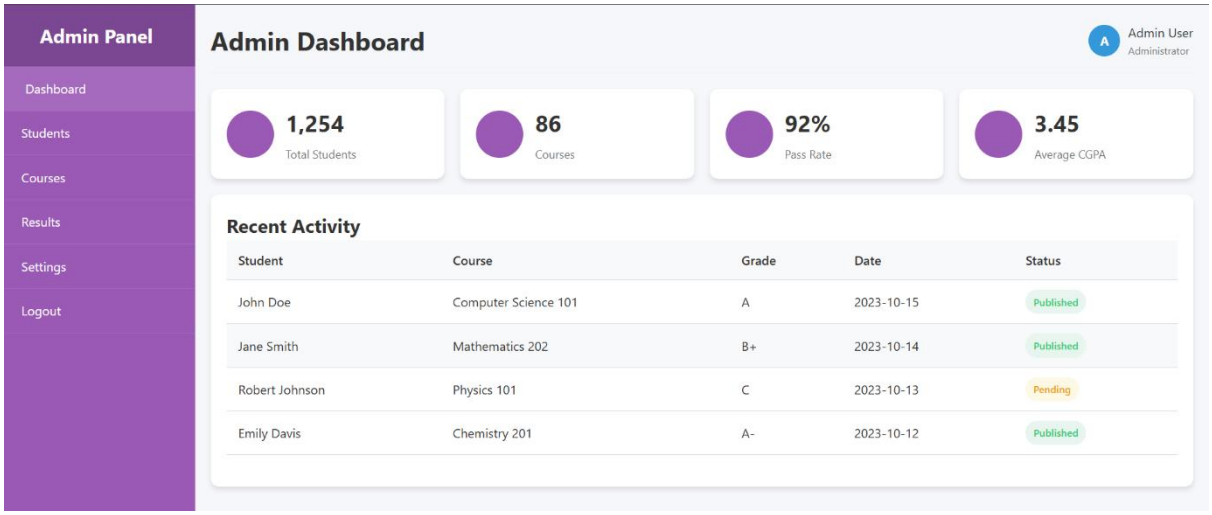

Figure 4.7: Admin Dashboard

3. **Student Dashboard:** The student portal, allowing students to view their results, calculate their CGPA, and update their profiles.

   This is the dashboard when a student has successfully logged in. All the various tasks that can be performed by the student is shown on this page:

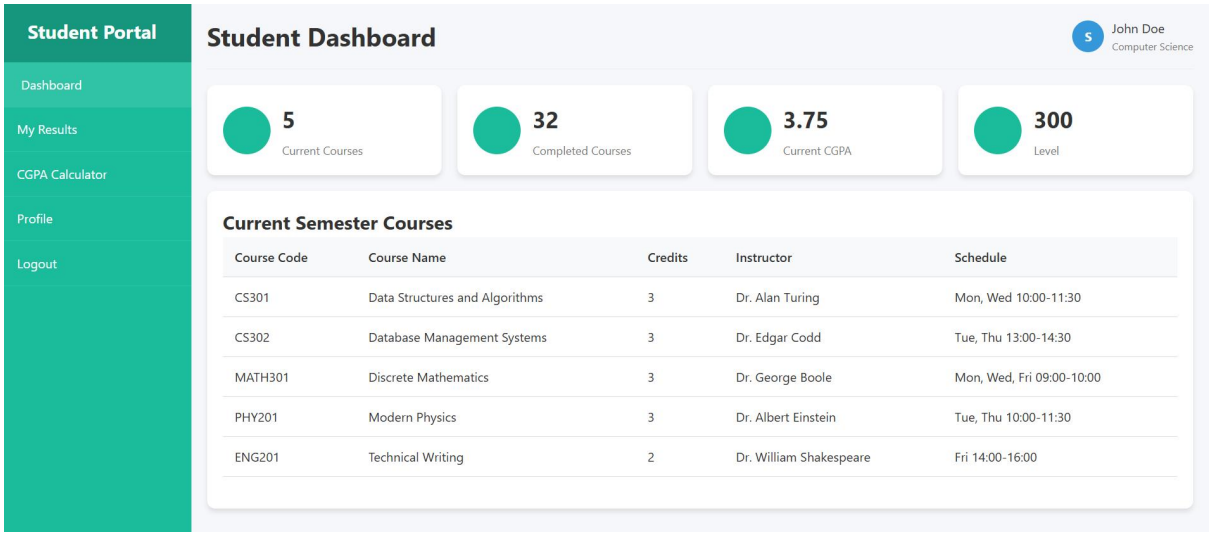

Figure 4.8: Student Dashboard

These screenshots confirm the successful implementation of the core user interfaces and the foundational functionality of the RBMS.

CHAPTER FIVE

SUMMARY CONCLUSION, AND RECOMMENDATION

5.0 Summary

This project has successfully accomplished the design and implementation of a Web-Based Result Management System for the Computer Science Department at the University of Benin. The developed system effectively automates the computation and management of student results, directly addressing the critical challenges—such as human error, delayed accessibility, and operational inefficiency—inherent in the department's previous manual methods.

The development process adhered to the Structured System Analysis and Design Methodology (SSADM), ensuring a disciplined and phased approach from analysis to implementation. The system was constructed using a modern web technology stack, including HTML, CSS, JavaScript, PHP, and MySQL, chosen for their platform independence and suitability for building dynamic web applications. Rigorous testing was conducted to validate that the system meets all specified requirements, particularly the accurate calculation of GPA and CGPA.

This study is significant as it presents a more efficient, reliable, and transparent alternative to the current grade point calculation method. It serves as a viable model that can be adopted by the Department of Computer Science and potentially scaled for use across other departments and higher institutions.

5.1 Conclusion

The primary objective of this research was to design and implement a Result-Based Management System for the Computer Science Department at the University of Benin. This goal has been satisfactorily achieved.

The developed RBMS effectively tackles the key problems associated with manual result computation, including inaccuracies, delays, and difficulties in data retrieval. By automating the calculation of grade points, generating CGPA reports, and maintaining a secure, organized repository of academic records, the system significantly enhances transparency, consistency, and reliability in the academic assessment process. In summary, this project delivers a valuable tool that simplifies and streamlines CGPA computation, contributing meaningfully to improved academic management and empowering both students and institutions with accurate and timely performance tracking.

5.2 Recommendation

To ensure the long-term effectiveness, sustainability, and continuous improvement of the Result-Based Management System, the following recommendations are proposed:

1. **Institutional Adoption:** The management of the Computer Science Department and the University of Benin should consider formally adopting and integrating this system into their academic administrative processes to ensure accurate and timely grade computation.
2. **Comprehensive User Training:** Academic and administrative staff should receive thorough training on how to use the system effectively. This will minimize user-induced errors and maximize the system's utility.
3. **Iterative Feedback Mechanism:** A structured process for collecting periodic feedback from users (students, lecturers, and administrators) should be established to identify areas for enhancement and guide future updates.
4. **Scheduled System Updates:** The system should be regularly maintained and updated to accommodate changes in institutional grading policies, course structures, and evolving academic standards.

5. **Focus on Scalability and Security:** Future developers should continue to prioritize the system's scalability to handle growing data loads and its security to protect sensitive student information against threats.
6. **Dedicated Technical Support:** The institution should ensure that adequate technical support is available to promptly address any issues that may arise during the system's operational lifecycle, ensuring minimal disruption.

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APPENDIX

SOURCE CODE

```
<!-- Login Page -->
   <div id="login-page" class="login-container">
      <div class="login-card">
         <div class="logo">
            <i class="fas fa-graduation-cap"></i>
            <h1>EduResult</h1>
         </div>
         <div class="login-form card">
            <h2>Sign In to Your Account</h2>
            <div class="user-type-selector">
               <div class="user-type active" data-type="student">Student</div>
               <div class="user-type" data-type="admin">Admin</div>
            </div>
            <form id="login-form">
               <div class="form-group">
                  <label for="username">Username</label>
                  <input type="text" id="username" class="form-control" placeholder="Enter
your username" required>
```

```
                </div>
                <div class="form-group">
                    <label for="password">Password</label>
                    <input type="password" id="password" class="form-control" placeholder="Enter your password" required>
                </div>
                <button type="submit" class="btn btn-primary" style="width: 100%;">Sign In</button>
            </form>
            <p style="margin-top: 15px; font-size: 0.9rem;">
                <a href="#" style="color: var(--primary);">Forgot your password?</a>
            </p>
        </div>
    </div>
</div>

<!-- Admin Dashboard -->
<div id="admin-dashboard" class="dashboard" style="display: none;">
    <div class="sidebar admin-sidebar">
        <div class="sidebar-header">
```

```
            <h2><i class="fas fa-user-shield"></i> Admin Panel</h2>
        </div>
        <ul class="sidebar-menu">
            <li><a href="#" class="active" data-section="admin-overview"><i class="fas fa-tachometer-alt"></i> Dashboard</a></li>
            <li><a href="#" data-section="admin-students"><i class="fas fa-users"></i> Students</a></li>
            <li><a href="#" data-section="admin-courses"><i class="fas fa-book"></i> Courses</a></li>
            <li><a href="#" data-section="admin-results"><i class="fas fa-chart-bar"></i> Results</a></li>
            <li><a href="#" data-section="admin-settings"><i class="fas fa-cog"></i> Settings</a></li>
            <li><a href="#" id="admin-logout"><i class="fas fa-sign-out-alt"></i> Logout</a></li>
        </ul>
    </div>
    <div class="main-content">
        <div class="header">
            <h1 id="admin-section-title">Admin Dashboard</h1>
            <div class="user-info">
```

```
                <div class="user-avatar">A</div>
                <div>
                    <div>Admin User</div>
                    <div style="font-size: 0.8rem; color: #777;">Administrator</div>
                </div>
            </div>
        </div>
<!-- Student Dashboard -->
    <div id="student-dashboard" class="dashboard" style="display: none;">
        <div class="sidebar student-sidebar">
            <div class="sidebar-header">
                <h2><i class="fas fa-user-graduate"></i> Student Portal</h2>
            </div>
            <ul class="sidebar-menu">
                <li><a href="#" class="active" data-section="student-overview"><i class="fas fa-tachometer-alt"></i> Dashboard</a></li>
                <li><a href="#" data-section="student-results"><i class="fas fa-chart-bar"></i> My Results</a></li>
                <li><a href="#" data-section="student-cgpa"><i class="fas fa-calculator"></i> CGPA Calculator</a></li>
```

```
            <li><a href="#" data-section="student-profile"><i class="fas fa-user"></i>
Profile</a></li>
            <li><a href="#" id="student-logout"><i class="fas fa-sign-out-alt"></i>
Logout</a></li>
        </ul>
    </div>
    <div class="main-content">
        <div class="header">
            <h1 id="student-section-title">Student Dashboard</h1>
            <div class="user-info">
                <div class="user-avatar">S</div>
                <div>
                    <div>John Doe</div>
                    <div style="font-size: 0.8rem; color: #777;">Computer Science</div>
                </div>
            </div>
        </div>

        <!-- Student Overview Section -->
        <div id="student-overview" class="dashboard-section">
```

```
<div class="stats-container">
    <div class="stat-card">
        <div class="stat-icon student-stat-icon">
            <i class="fas fa-book"></i>
        </div>
        <div class="stat-info">
            <h3>5</h3>
            <p>Current Courses</p>
        </div>
    </div>
    <div class="stat-card">
        <div class="stat-icon student-stat-icon">
            <i class="fas fa-check-circle"></i>
        </div>
        <div class="stat-info">
            <h3>32</h3>
            <p>Completed Courses</p>
        </div>
    </div>
    <div class="stat-card">
```

```
                <div class="stat-icon student-stat-icon">
                    <i class="fas fa-graduation-cap"></i>
                </div>
                <div class="stat-info">
                    <h3>3.75</h3>
                    <p>Current CGPA</p>
                </div>
            </div>
            <div class="stat-card">
                <div class="stat-icon student-stat-icon">
                    <i class="fas fa-calendar"></i>
                </div>
                <div class="stat-info">
                    <h3>300</h3>
                    <p>Level</p>
                </div>
            </div>
        </div>
<!-- Student CGPA Calculator Section -->
        <div id="student-cgpa" class="dashboard-section" style="display: none;">
```

```
<div class="cgpa-calculator">
    <h2>CGPA Calculator</h2>
    <p>Add your courses and grades to calculate your CGPA</p>

    <div id="course-entries">
        <div class="course-input">
            <input type="text" placeholder="Course Code" class="course-code">
            <input type="text" placeholder="Course Name" class="course-name">
            <input type="number" placeholder="Credits" class="course-credits" min="1" max="5">
            <select class="course-grade">
                <option value="">Select Grade</option>
                <option value="4.0">A (4.0)</option>
                <option value="3.7">A- (3.7)</option>
                <option value="3.3">B+ (3.3)</option>
                <option value="3.0">B (3.0)</option>
                <option value="2.7">B- (2.7)</option>
                <option value="2.3">C+ (2.3)</option>
                <option value="2.0">C (2.0)</option>
                <option value="1.7">C- (1.7)</option>
```

```
                    <option value="1.3">D+ (1.3)</option>
                    <option value="1.0">D (1.0)</option>
                    <option value="0.0">F (0.0)</option>
                </select>
                <button class="btn btn-danger remove-course" style="padding: 5px 10px;"><i class="fas fa-times"></i></button>
            </div>
        </div>

        <button class="btn btn-student" id="add-course"><i class="fas fa-plus"></i> Add Another Course</button>
        <button class="btn btn-success" id="calculate-cgpa" style="margin-left: 10px;"><i class="fas fa-calculator"></i> Calculate CGPA</button>

        <div id="cgpa-result" class="cgpa-result" style="display: none;">
            <h3>Your CGPA is:</h3>
            <div class="cgpa-value" id="cgpa-value">0.00</div>
            <p>Based on <span id="total-credits">0</span> credit hours</p>
        </div>
    </div>
```

```
<div class="card">
    <h2>CGPA Information</h2>
    <p>The Cumulative Grade Point Average (CGPA) is calculated by dividing the total grade points earned by the total credit hours attempted.</p>
    <div class="table-responsive">
      <table>
        <thead>
          <tr>
            <th>Grade</th>
            <th>Grade Points</th>
            <th>Percentage Equivalent</th>
          </tr>
        </thead>
        <tbody>
          <tr>
            <td>A</td>
            <td>4.0</td>
            <td>93-100%</td>
          </tr>
```

```
<tr>
    <td>A-</td>
    <td>3.7</td>
    <td>90-92%</td>
</tr>
<tr>
    <td>B+</td>
    <td>3.3</td>
    <td>87-89%</td>
</tr>
<tr>
    <td>B</td>
    <td>3.0</td>
    <td>83-86%</td>
</tr>
<tr>
    <td>B-</td>
    <td>2.7</td>
    <td>80-82%</td>
</tr>
```

```
<tr>
    <td>C+</td>
    <td>2.3</td>
    <td>77-79%</td>
</tr>
<tr>
    <td>C</td>
    <td>2.0</td>
    <td>73-76%</td>
</tr>
<tr>
    <td>C-</td>
    <td>1.7</td>
    <td>70-72%</td>
</tr>
<tr>
    <td>D+</td>
    <td>1.3</td>
    <td>67-69%</td>
</tr>
```

```
                <tr>
                    <td>D</td>
                    <td>1.0</td>
                    <td>60-66%</td>
                </tr>
                <tr>
                    <td>F</td>
                    <td>0.0</td>
                    <td>Below 60%</td>
                </tr>
            </tbody>
        </table>
    </div>
  </div>
</div>
```